

Application No.: 10/634,304

Docket No.: MWS-030RCE2

**REMARKS**

In this Response, Applicants amend claims 1-5, 8-28, 31, 33, 35-37, 39, 42 and 43, and cancel claims 6, 7, 38, 40 and 41. Claims 1-5, 8-37, 39 and 42-47 are currently pending, of which claims 1, 21, 28 and 37 are independent. Support for the amendments can be found at least in Applicants' Figure 6 and related text. Applicants respectfully request reconsideration of the outstanding rejections and allowance of all pending claims in view of the reasons set forth below.

**I. Rejection of Claims 1-3, 5, 21-23, 26-33, 36-40 and 44-47 under 35 U.S.C. § 103(a)**

Claims 1-3, 5, 21-23, 26-33, 36-40 and 44-47 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2001/0025292 to Denk et al. (hereafter "Denk") in view of "Digital Filter Solutions" (hereafter "DFS") (Office Action, paragraph 4). Applicants respectfully traverse 35 U.S.C. § 103(a) rejection of claims 1-3, 5, 21-23, 26-33, 36-40 and 44-47 as set forth below.

**A. Claim 1**

Amended independent claim 1 recites:

"In a computer system, a method for implementing and using a filter object, the method comprising:  
providing the filter object, the filter object including a state, and the filter object being represented by:  
an output equation for generating an output of the filter object, and  
a state equation for updating the state of the filter object;  
implementing the filter object; and  
using the filter object in a first dynamically typed text-based programming environment, the using the filter object including:  
receiving an input at the filter object,  
identifying a first state of the filter object,  
processing the output equation to determine an output of the filter object based on the input of the filter object and the first state of the filter object,  
*processing the state equation to determine a second state of the filter object based on the input of the filter object and the first state of the filter object,*

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*retaining the second state of the filter object in the first dynamically typed text-based programming environment, and making the second state available after the output equation of the filter object is processed.” [emphasis added]*

Applicants respectfully submit that Denk and DFS, alone or in any reasonable combination, fail to disclose or suggest at least the following features of amended independent claim 1: “processing the state equation to determine a second state of the filter object based on the input of the filter object and the first state of the filter object,” “retaining the second state of the filter object in the first dynamically typed text-based programming environment” and “making the second state available after the output equation of the filter object is processed.”

i. “processing the state equation to determine a second state of the filter object based on the input of the filter object and the first state of the filter object”

Denk and DFS, alone or in any reasonable combination, fail to disclose or suggest “processing the state equation to determine a second state of the filter object based on the input of the filter object and the first state of the filter object,” as recited in claim 1.

Denk does not disclose or suggest “processing the state equation to determine a second state of the filter object based on the input of the filter object and the first state of the filter object,” as recited in claim 1. Denk discloses a state with respect to bias rounding, but does not disclose or suggest how a state is determined. Since Denk does not disclose or suggest how a state is determined, Denk cannot disclose or suggest how a first state is determined for a filter object, let alone disclose or suggest how “a second state of a filter object” is determined “based on an input to the filter object and a first state of the filter object,” as required by claim 1.

The teachings of DFS do not supplement Denk in such a way as to cure the failure of Denk to disclose or suggest the above feature of claim 1.

DFS discusses output operations of Z transforms represented using the term “Z” which refers to an inverse past value (DFS, page 6). Thus, for each output operation, the Z transforms use inverse past values. However, none of the operations in DFS use a previous state, and thus

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DFS cannot disclose or suggest an operation based on both a previous input and a previous state of a filter object. Therefore, DFS does not disclose or suggest "processing the state equation to determine a second state of the filter object based on the input of the filter object and the first state of the filter object," as recited in claim 1. Since neither Denk nor DFS disclose or suggest this feature of claim 1, Denk and DFS cannot support a valid 35 U.S.C. §103(a) of claim 1.

**ii. "retaining the second state of the filter object in the first dynamically typed text-based programming environment" and "making the second state available after the output equation of the filter object is processed"**

Denk and DFS, alone or in any reasonable combination, fail to disclose or suggest "retaining the second state of the filter object in the first dynamically typed text-based programming environment" and "making the second state available after the output equation of the filter object is processed," as recited in claim 1.

With regard to "retaining the state of the filter object," as recited in previously presented claim 1, the Examiner points to paragraphs 0023, 0070 and 0122 in Denk as disclosing or suggesting this feature (Office Action, paragraph 4):

"As per claim 1,  
Denk et al. disclose...

*retaining the state of the filter object, wherein the filter object is implemented and used in a first dynamically typed text-based programming environment, ([0023], "... state-based control..."; since it is state-based, state is retained for processing; [0122], "... LMS adaptive filter... Filter 1700 includes FIR filter taps..."; see Speciation [sic], page 6, 1<sup>st</sup> paragraph, for example, description of FIR filter; [0070], "The Matlab@..." where it shows a dynamically types text-based programming environment is used to implement such filter.)" [emphasis added]*

The Examiner's reliance on Denk is misplaced. The sections of Denk cited by the Examiner do not disclose or suggest "retaining the second state of the filter object in the first dynamically typed text-based programming environment" and "making the second state available after the output equation of the filter object is processed," as recited in claim 1. For the

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sake of completeness, each of the sections of Denk cited by the Examiner are addressed separately below.

At paragraph 0023, Denk discusses state-based control of the selectable bias of a rounding device. However, this portion of Denk does not discuss retaining a state of such a state-based control. Any state used in controlling the selectable bias in Denk is not retained so that the state is available after the output equation of a filter object is processed.

At paragraph 0070, Denk discusses that selectable bias rounding can be modeled in the MATLAB computing environment. However, this portion of Denk does not address states at all. Although Denk mentions performing bias rounding in the MATLAB environment (Denk, paragraph 0070), there is no mention of retaining a state in such an environment. Any state used in rounding bias in Denk is not retained so that the state is available after the output equation of a filter object is processed.

At paragraph 0122, Denk discusses modeling the filter taps of a finite impulse response (FIR) filter. This portion of Denk does not mention what the states are in the FIR filter and, more specifically, does not disclose or suggest retaining a state of the FIR filter after processing the output equation of the filter.

The disclosures of DFS do not supplement Denk in such a way as to cure the failure of Denk to disclose or suggest the above feature of claim 1.

For example, DFS does not disclose or suggest "retaining the second state of the filter object in the first dynamically typed text-based programming environment" and "making the second state available after the output equation of the filter object is processed," as recited in claim 1, because DFS does not mention a state of a filter object or retaining a state of a filter object. DFS depicts graphical implementations of Z transforms, all of which show a single output operation (DFS, pages 7 and 8). However, DFS does not discuss what happens to any state of the system after an output operation is processed.

In addition, DFS does not disclose or suggest retaining a state in a dynamically typed text-based programming environment, as required by claim 1.

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A combination of Denk and DSF fails to disclose or suggest each and every element of amended claim 1. Accordingly, Applicants respectfully request the Examiner to reconsider and to withdraw the rejection of claim 1 under 35 U.S.C. § 103(a).

**B. Claims 2, 3 and 5**

Claims 2, 3 and 5 depend from claim 1 and, as such, incorporate each and every element of claim 1. Therefore, claims 2, 3 and 5 are allowable for at least the same reasons discussed above for claim 1. Accordingly, Applicants respectfully request the Examiner to reconsider and to withdraw the rejection of claims 2, 3 and 5 under 35 U.S.C. § 103(a).

**C. Claim 21**

Amended independent claim 21 recites:

“A computer-implemented method for generating an output of a system in response to an input to the system, the method comprising:  
    implementing the system using a dynamically typed text-based programming environment; and  
    using the system in the dynamically typed text-based programming environment, the system:  
        determining an output of the system based on an input to the system and a first state of the system;  
        *determining a second state of the system based on the input to the system and the first state of the system; and*  
        *retaining the second state of the system in the dynamically typed text-based programming environment so that the second state is available after the output of the system is determined.*” [emphasis added]

In view of the remarks set forth above in connection with claim 1, Applicants respectfully submit that a combination of Denk and DFS fails to disclose or suggest at least the following features of amended independent claim 21: “determining a second state of the system based on the input to the system and the first state of the system” and “retaining the second state of the system in the dynamically typed text-based programming environment so that the second state is available after the output of the system is determined.” A combination of Denk and DFS does not disclose or suggest determining a second state of a system based on the input of the

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system and the first state of the system. Furthermore, a combination of Denk and DFS does not disclose or suggest retaining a state of a system so that the state is available after the output of the system is determined. Accordingly, Applicants respectfully request the Examiner to reconsider and to withdraw the rejection of claim 21 under 35 U.S.C. § 103(a).

**D. Claims 22, 23, 26 and 27**

Claims 22, 23, 26 and 27 depend from claim 21 and, as such, incorporate each and every element of claim 21. Therefore, claims 22, 23, 26 and 27 are allowable for at least the same reasons discussed above for claim 21. Accordingly, Applicants respectfully request the Examiner to reconsider and to withdraw the rejection of claims 22, 23, 26 and 27 under 35 U.S.C. § 103(a).

**E. Claim 28**

Amended independent claim 28 recites:

**"A computer readable medium holding instructions executable in a computer that provides a dynamically typed text-based programming environment, the instructions comprising:  
providing an object, the object being an instance of a class;  
determining an output of the object based on an input to the object and a first state of the object;  
*determining a second state of the object based on the input to the object and the first state of the object;*  
*retaining the second state of the object in the dynamically typed text-based programming environment;* and  
*making the second state available after determining the output of the object.*" [emphasis added]**

In view of the remarks set forth above in connection with claim 1, Applicants respectfully submit that a combination of Denk and DFS fails to disclose or suggest at least the following features of amended independent claim 28: "determining a second state of the object based on the input to the object and the first state of the object," "retaining the second state of the object in the dynamically typed text-based programming environment" and "making the second state available after determining the output of the object." A combination of Denk and

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DFS does not disclose or suggest determining a second state of an object based on the input of the object and the first state of the object. Furthermore, a combination of Denk and DFS does not disclose or suggest retaining a state of an object in a dynamically typed text-based programming environment... and making the state available after determining the output of the object. Accordingly, Applicants respectfully request the Examiner to reconsider and to withdraw the rejection of claim 28 under 35 U.S.C. § 103(a).

**E. Claims 29-33 and 36**

Claims 29-33 and 36 depend from claim 28 and, as such, incorporate each and every element of claim 28. Therefore, claims 29-33 and 36 are allowable for at least the same reasons discussed above for claim 28. Accordingly, Applicants respectfully request the Examiner to reconsider and to withdraw the rejection of claims 29-33 and 36 under 35 U.S.C. § 103(a).

**G. Claim 37**

Amended independent claim 37 recites:

**“A system for implementing a filter object, the system comprising:  
a processor configured to process:  
an output equation of the filter object to determine an  
output of the filter object based on an input to the filter object and  
a first state of the filter object;  
a state equation of the filter object to determine a second  
state of the filter object based on the input to the filter object and  
the first state of the filter object; and  
a memory for retaining the second state of the filter object  
in a dynamically typed text-based programming environment so  
that the second state is available after the output equation is  
processed.” [emphasis added]**

In view of the remarks set forth above in connection with claim 1, Applicants respectfully submit that a combination of Denk and DFS fails to disclose or suggest at least the following features of amended independent claim 37: “a state equation of the filter object to determine a second state of the filter object based on the input to the filter object and the first state of the filter object” and “a memory for retaining the second state of the filter object in a dynamically typed text-based programming environment so that the second state is available

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after the output equation is processed." A combination of Denk and DFS does not disclose or suggest determining a second state of a filter object based on the input of the filter object and the first state of the filter object. Furthermore, a combination of Denk and DFS does not disclose or suggest retaining a state of a filter object so that the state is available after determining an output equation is processed. Accordingly, Applicants respectfully request the Examiner to reconsider and to withdraw the rejection of claim 37 under 35 U.S.C. § 103(a).

#### **H. Claims 38-40 and 44-47**

Claims 38, 40 and 41 have been canceled. As such, the 35 U.S.C. § 103(a) rejection of claims 38, 40 and 41 is moot.

Claims 39 and 44-47 depend from claim 37 and, as such, incorporate each and every element of claim 37. Therefore, claims 39 and 44-47 are allowable for at least the same reasons discussed above for claim 37. Accordingly, Applicants respectfully request the Examiner to reconsider and to withdraw the rejection of claims 39 and 44-47 under 35 U.S.C. § 103(a).

#### **II. Rejection of Claims 4, 24, 25, 34, 42 and 43 under 35 U.S.C. § 103(a)**

Claims 4, 24, 25, 34, 42 and 43 are rejected under 35 U.S.C. § 103(a) as being Denk in view of DFS and further in view of United States Patent Number 5,677,951 to Gay (hereafter "Gay") (Office Action, paragraph 5). Applicants respectfully traverse 35 U.S.C. § 103(a) rejection of claims 4, 24, 25, 34, 42 and 43 as set forth below.

Denk and DFS have been summarized above

A combination of Denk, DFS and Gay does not disclose or suggest the features of claims 4, 24, 25, 34, 42 and 43. As discussed previously in connection with claim 1, a combination of Denk and DFS fails to disclose or suggest the features of claims 1, 21, 28, and 37 from which claims 4, 24, 25, 34, 42 and 43 depend. The teachings of Gay do not supplement Denk and DFS in such a way as to cure the shortcomings of Denk and DFS with respect to the features of independent claims 1, 21, 28, and 37.

Gay discusses an adaptive filtering technique applicable to acoustic echo cancellation (Col. 1, lines 6-8). The cited sections of Gay in paragraph 5 of the Office Action discuss a

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method of use of an adaptive filter (Col. 3, lines 5-26). The Examiner specifically points to the section where Gay discusses a controller providing an *audio* restart signal to the process extension unit of the adaptive filter (Col. 3, lines 9-13).

Gay fails to disclose or suggest "processing the state equation to determine a second state of the filter object based on the input of the filter object and the first state of the filter object," "retaining the second state of the filter object in the first dynamically typed text-based programming environment" and "making the second state available after the output equation of the filter object is processed," as recited in amended independent claim 1. As such, a combination of Denk, DFS and Gay fails to disclose or suggest the features of claim 4 which depends on claim 1.

Gay fails to disclose or suggest "determining a second state of the system based on the input to the system and the first state of the system" and "retaining the second state of the system in the dynamically typed text-based programming environment so that the second state is available after the output of the system is determined," as recited in amended independent claim 21. As such, a combination of Denk, DFS and Gay fails to disclose or suggest the features of claims 24 and 25 which depend on claim 21.

Gay fails to disclose or suggest "determining a second state of the object based on the input to the object and the first state of the object," "retaining the second state of the object in the dynamically typed text-based programming environment" and "making the second state available after determining the output of the object," as recited in amended independent claim 28. As such, a combination of Denk, DFS and Gay fails to disclose or suggest the features of claim 34 which depends on claim 28.

Gay fails to disclose or suggest "a state equation of the filter object to determine a second state of the filter object based on the input to the filter object and the first state of the filter object" and "a memory for retaining the second state of the filter object in a dynamically typed text-based programming environment so that the second state is available after the output equation is processed," as recited in amended independent claim 37. As such, a combination of Denk, DFS and Gay fails to disclose or suggest the features of claims 42 and 43 which depend on claim 37.

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As such, a combination of Denk, DFS and Gay does not disclose or suggest each and every element of claims 4, 24, 25, 34, 42 and 43. Accordingly, Applicants respectfully request the Examiner to reconsider and to withdraw the rejection of claims 4, 24, 25, 34, 42 and 43 under 35 U.S.C. § 103(a).

### **III. Rejection of Claims 8-20 under 35 U.S.C. § 103(a)**

Claims 8-20 are rejected under 35 U.S.C. § 103(a) as being Denk in view of DFS and further in view of "AutoCode Solutions" (hereafter "AutoCode") (Office Action, paragraph 6). Applicants respectfully traverse 35 U.S.C. § 103(a) rejection of claims 8-20 as set forth below.

Denk and DFS have been summarized above in connection with claim 1.

A combination of Denk, DFS and AutoCode does not disclose or suggest the features of claims 8-20. As discussed previously in connection with claim 1, a combination of Denk and DFS fails to disclose or suggest the features of claim 1 from which claims 8-20 depend. The teachings of AutoCode do not supplement Denk and DFS in such a way as to cure the shortcomings of Denk and DFS with respect to the features of independent claim 1.

AutoCode discusses the capability to generate C code for a digital filter in the same form and precision, up to 16 digits, that is specified in a Z transform (AutoCode, "General Information"). The code is compatible with any standard C or C++ compiler (AutoCode, "General Information"). The filter may be initialized at any point in time to any value, except that pass band filters only initialize to zero (AutoCode, "General Information"). The filter starts with an initial value of zero at the first call (AutoCode, "General Information").

AutoCode fails to disclose or suggest "processing the state equation to determine a second state of the filter object based on the input of the filter object and the first state of the filter object," "retaining the second state of the filter object in the first dynamically typed text-based programming environment" and "making the second state available after the output equation of the filter object is processed," as recited in amended independent claim 1. As such, a combination of Denk, DFS and AutoCode fails to disclose or suggest the features of claims 8-20 which depend on claim 1.

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As such, a combination of Denk, DFS and AutoCode does not disclose or suggest each and every element of claims 8-20. Accordingly, Applicants respectfully request the Examiner to reconsider and to withdraw the rejection of claims 8-20 under 35 U.S.C. § 103(a).

**IV. Rejection of Claims 35 under 35 U.S.C. § 103(a)**

Claim 35 is rejected under 35 U.S.C. § 103(a) as being Denk in view of DFS and further in view of United States Patent Publication Number 2002/0147554 to Pickerd (hereafter "Pickerd") (Office Action, paragraph 7). Applicants respectfully traverse 35 U.S.C. § 103(a) rejection of claim 35 as set forth below.

Denk and DFS have been summarized above.

A combination of Denk, DFS and Pickerd does not disclose or suggest the features of claim 35. As discussed previously in connection with claim 28, a combination of Denk and DFS fails to disclose or suggest the features of claim 28 from which claim 35 depends. The teachings of Pickerd do not supplement Denk and DFS in such a way as to cure the shortcomings of Denk and DFS with respect to the features of independent claim 28.

Pickerd concerns test and measurement instruments, such as digital oscilloscopes (Pickerd, [0002]). Pickerd discusses a streaming distributed oscilloscope architecture that would reduce the dead time and increase the probability of detecting dead times (Pickerd, [0007]). As such, Pickerd is generally directed to hardware implementations.

Pickerd fails to disclose or suggest "determining a second state of the object based on the input to the object and the first state of the object," "retaining the second state of the object in the dynamically typed text-based programming environment" and "making the second state available after determining the output of the object," as recited in amended independent claim 28. As such, a combination of Denk, DFS and Pickerd fails to disclose or suggest the features of claim 35 which depends on claim 28.

As such, a combination of Denk, DFS and Pickerd does not disclose or suggest each and every element of claim 35. Accordingly, Applicants respectfully request the Examiner to reconsider and to withdraw the rejection of claim 35 under 35 U.S.C. § 103(a).

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**CONCLUSION**

In view of the above comments, Applicants believe the pending application is in condition for allowance and urge the Examiner to pass the claims to allowance. Should the Examiner feel that a teleconference would expedite the prosecution of this application, the Examiner is urged to contact the Applicants attorney at (617) 227-7400.

Please charge any shortage or credit any overpayment of fees to our Deposit Account No. 12-0080, under Order No. MWS-030RCE2. In the event that a petition for an extension of time is required to be submitted herewith, and the requisite petition does not accompany this response, the undersigned hereby petitions under 37 C.F.R. § 1.136(a) for an extension of time for as many months as are required to render this submission timely. Any fee due is authorized to be charged to the aforementioned Deposit Account.

Dated: July 14, 2008

Respectfully submitted,

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